Dr. P. Biji
Professor & Head
Department of Chemistry & Nanoscience & Technology
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Address: Room No., Floor No., I-Block,
PSG Institute of Advanced Studies,
Peelamedu, Coimbatore-641004

BIOSKETCH

The Nanosensors & Clean Energy Laboratory focuses on applying nanotechnology to develop nanosensor devices and clean energy solutions for real-world applications. Our multidisciplinary research emphasizes designing nanoscale materials with tunable charge transport for sensors and renewable energy systems. Current focus of our team include PEM fuel cell stack development using mesoporous carbon fiber-based electrocatalyst supports, AEM-based seawater electrolyzers for green hydrogen production, urea electrolyzers for wastewater-to-energy conversion. In the area of sensor technologies, we focus on development of gas sensors for environmental monitoring and breath analysis, and microfluidic electrochemical sensor platforms for water quality monitoring and 3D printed SERS biosensor platforms for cancer diagnosis. The lab is equipped with state-of-the-art facilities for sensor fabrication, calibration, and fuel cell testing. We have also developed large area superhydrophobic self-cleaning for solar panels, extended to large-area applications including glass facades, marine coatings, smart textiles, and tiles. Additionally, our group has pioneered a silver-free front contact metallization strategy using nanoimprint lithography to minimize shadow losses in solar cells, offering sustainable, scalable solutions for next-generation energy technologies.

Educational Profile

- **Ph.D. (Chemistry) – IIT Madras**
  Year of Passing: 2009
  Thesis title: "Hybrid Gold Nanoarchitectures for Directed Electron Transport"

- **M.Sc. (Applied Chemistry)**
  Cochin University of Science and Technology, Kerala, 2003

Positions Held

1. ***Institution***: PSG Institute of Advanced Studies, Coimbatore (2009-2017)
   Assistant Professor in Nanotechnology : 2009-2013
   Assistant Professor (Sr. Gr.) in Nanotechnology : 2013-2015
   Assistant Professor (Sel. Gr.) in Nanotechnology : 2015-2016
   Associate Professor in Nanotechnology **: 2016-2017**

2. ***Institution***: PSG College of Technology, Coimbatore
   Associate Professor in Chemistry **: 2017-2019**

3. ***Institution***: PSG Institute of Advanced Studies, Coimbatore
   Associate Professor in Nanotechnology **: 2019-2022**
   Professor in Nanotechnology **: 2022-Till date**

Administrative Role:
Head, Department of Chemistry & Nanoscience and Technology, PSGIAS: 2021-Till date

Research Areas

- PEM Fuel Cells
- Green Hydrogen Production
- Self-cleaning coatings for PV and non-PV applications
- Gas sensors and ion selective sensors

Awards & Achievements

- Society for Materials Chemistry (SMC) Bronze Medal-2024 award received at BARC, Mumbai on 5th December, **2024**.
- MILIR-2024 Best Scientist award, Rathinam Group of Institutions, Coimbatore 8th March, **2024**
- Best faculty award, BE/BS program, PSG Institute of Advanced Studies, Coimbatore, **2019**.
- Best women faculty award, PSG Institute of Advanced Studies, Coimbatore, *Women's day celebrations*, PSG Institutions, 8th March, **201**7.
- Best Paper Award in "*International Conference on MEMS and Sensors (ICMEMSS 2014)*", IIT Madras, 18-20th December, **2014**.
- Best Poster Award in "*International conference on Advanced Polymeric Materials 2013 (ICAPM 2013)"*, Mahatma Gandhi University, Kottayam, 11-13th, October, **2013.**
- Best Poster Award in "*International Conference on Functional Materials (FM 2008)*", IIT Madras, November 27-29, **2008**.
- Selected candidate from IITM, by the Indo-France exchange program and travel grant award for participating in the Nanotechnology hands on training program "*European School on Nanosciences and Nanotechnologies (ESSON-2007)*" at Grenoble, France in **2007**.
- Qualified National Eligibility Test (CSIR-UGC-NET) for Lectureship in **2004**.
- Awarded HTRA research fellowship for PhD programme at IIT Madras in **2004**.
- Qualified Graduate Aptitude Test in Engineering (GATE) in **2003**.

Research Group

Research Scholars (Ongoing)

Ongoing PhD Scholars

Rajesh U P
Designation : Research Scholar (JRF)
Area of research : Hydrogel based SERS Biosensors

Divya Sreetha M
Designation : Junior Research Fellow (JRF)
Area of research : Hydrogen gas sensors

Athira Suresh
Designation : Research Scholar (JRF)
Area of research : Superhydrophobic coatings for drag reduction

Athul Pradeep A
Designation : Junior Research Scholar (JRF)
Area of research : Graphene based less-Pt Electrocatalysts for PEM Fuel Cells

Irshad M. K
Designation : Project Assistant
Area of research : AEM based Sea Water Electrolyzer

ALUMNI

Navami Sunil
Year of passing : 2025
University : Bharathiar University, Chennai
Title of Thesis : "*Non-Invasive, Surface Enhanced Raman Spectroscopy based Salivary Sensor Platform for Detection of Cancer Biomarkers*"
Present Position: Postdoctoral Fellow, Palacky University, Czechia

Dr. A. Mahaboob Batcha
Year of passing : 2021
University : Anna University, Chennai
Title of Thesis : "*Advanced Micro-Patterned, Narrow Finger Width Front Contact Metallization Schemes for Silicon Solar Cells*"
Present Position: Postdoctoral Fellow, North Carolina State University, Raleigh, USA

Dr. R. Vishnuraj
Year of passing : 2021
University : Bharathiar University, Coimbatore
Title of Thesis : "*Unraveling Mechanistic Pathways of Heterojunction Metal Oxides based NO_2 Gas Sensors*"
Present Position: Postdoctoral Fellow, Amrita Vishwa Vidyapeetham, Coimbatore

Dr. Keerthi G. Nair
Year of passing : 2021
University : Bharathiar University, Coimbatore
Title of Thesis : "*Modulation of Hydrogen Sensing Properties of Carbon Nanofibers with Bimetallic Pt-nanocatalyst Heterojunctions at Room Temperature*"
Present Position: Assistant Professor, Federal Institute of Science and Technology (FISAT), Cochin, Kerala

Dr. Shalini Hallan
Year of passing : 2021
University : Anna University, Chennai
Title of Thesis : "*Bio-Inspired Hierarchical Photonic Nanostructures for Anti Reflective and Self-Cleaning Applications*"
Present Position: Scotland

Dr. V. R. Appu
Year of passing : 2020
University : Bharathiar University, Coimbatore
Thesis title : "*Temperature-Independent Oxygen Gas Sensing Properties of Mixed-Valence Vanadium Oxide based Nanosystems*"
Present Position: Post-Doctoral Researcher, Vienna University of Technology, Austria

Dr. K. K. Karthikeyan
Year of passing : 2019
University : Bharathiar University, Coimbatore
Thesis title : "*Novel Nanostructured Porous Carbon Based Electrocatalyst Support Materials for Extended Triple Phase Boundaries in Proton Exchange Membrane Fuel Cells*"
Present Position: Postdoctoral Fellow, University of Duisburg Essen, Germany

Dr. D. Jayaseelan
Year of passing : 2019
University : Anna University, Coimbatore
Thesis title : "*Investigation of Room Temperature Magnetic Ordering in Defect-Engineered TiO_2 Based Diluted Magnetic Oxide Semiconductors*"
Present Position: Post-Doctoral Fellow, SPS, NISER, Odisa

Dr. K. K. Aruna
Year of passing : 2018
University : Bharathiar University, Coimbatore
Thesis Title : "*Novel Three Dimensional Nanocarbon Hybrid Networks Modified with Noble and Non-Noble Electrocatalyst for Efficient Hydrogen Evolution Reaction*"
Present Position: Manager, Matlabs Technologies, Mumbai

Dr. A. Sukhananazerin
Year of passing : 2017
University : Bharathiar University, Coimbatore
Thesis Title : "*Investigation on Functionality-Dependent Ammonia Gas Sensing Properties of Carbon Nanotubes for Biomedical Applications*"
Present Position: Postdoctoral Fellow, University of Dublin, Ireland

Dr. V. P. Dinesh
Year of passing: 2016
University : Bharathiar University, Coimbatore
Thesis Title : "*Investigation on structure-property relationship of ZnO@Au core- shell, heterojunction nanostructures towards realization of high performance, low temperature NO_2 gas sensors*"
Present Position: Associate Professor, Dhanalakshmi Srinivasan University

Alumni - M.Phil (Nanoscience & Technology)

Mrs. K. Karthika
Year of passing: 2018
University : Bharathiar University, Coimbatore
Thesis Title : *Development of Superhydrophobic, Magnetic, Biodegradable Nanocellulose Sponge for Oil/Water Separation*

Mrs. Keerthi G. Nair
Year of passing: 2016
University : Bharathiar University, Coimbatore
Thesis Title : "*Ultra-long Silver Nanowires Based Conducting Nanoink and Nanocomposite for Electronics and Sensor Applications*"

Alumni – JRFs/Project Assistants

S. Nandagopal
Designation : Junior Research Fellow
Area of research : Oxygen sensor development

Kamini
Designation : Research Scholar (JRF)
Area of research : Superhydrophobic coatings for solar panels

S. Selvamani
Designation : Project Assistant
Area of research : Superhydrophobic coatings for solar panels

Gopee Krishnan
Designation : Junior Research Fellow
Area of research : Oxygen sensor development

Funded Projects

Name of sponsoring agency	Title of the project	Total (Rs)	Status
As Principal Investigator			
Ongoing			
DRDO-CARS	Exploration of Designing Parameters for Development of Robust and Durable Micro/Nanostructured Superomniphobic Fabrics	23.28 Lakhs	Ongoing (2025-2028)
SERB-CRG	Development of Less-Pt Ternary Alloy Nanoparticles Functionalized Porous Carbon Nanofibers based Flexible Hydrogen Sensor Devices for Safety and Process Control in Hydrogen Technologies	42.35 Lakhs	Ongoing (2024-2027)
CHT/MoP & NG	Development of Cost-Effective 2.5 kW PEM Fuel Cell Stack based on Less-Pt Bimetallic Electrocatalysts and Mesoporous Carbon support materials	3.86 Cr	Ongoing (2023-2025)
Completed			
DST-WTI, New Delhi	Development of Portable, Microfluidic NH_4^+ Ion Selective Electrochemical Sensor Platform based on Functional Nano-TiN Films for Re-Circulating Aquaculture Systems for Sustainable Environment	65.92 lakhs	Completed (2020-2024)
DST-HFC	Development of Mesoporous TiN@Nitrogen-Doped Carbon Nanostructured Support Materials with Less-Pt Electrocatalysts for Durable and Low-cost PEM Fuel Cells	54.51 lakhs	Completed (2019-2024)
DST-INSPIRE Fellowship (Mentor)	Non-Invasive Surface Enhanced Raman Spectroscopy (SERS) based Salivary Sensor Platform for Biomarkers Detection	INSPIRE Fellowship	Ongoing (2022-2025)
ONGC Energy Center	Fabrication of Self-Cleaning Coatings for Preliminary Industrial Evaluations	4.24 Lakhs	Completed (Oct 2023-Dec 2023)

ONGC Energy Center Trust, New Delhi	Development of Self-Cleaning Coatings based on Super-hydrophobicity for non-PV applications	73.75 lakhs	Completed (Sept 2019-Nov 2021)
ONGC Energy Center Trust, New Delhi	Upscaling the technology and preliminary field trials for Self-Cleaning Coatings based on Superhydrophobicity for Solar Panel applications	54.99 lakhs	Completed (Sept2019-April 2021)
ONGC, New Delhi	Development of Self-Cleaning Coatings Based on Superhydrophobicity for Solar Panel Applications	99.43 lakhs	Completed (2016-2019)
DST-SERI , New Delhi	Fabrication & Characterization of Nanoimprinted High Efficiency Crystalline Silicon Solar Cells	120 lakhs	Completed (2016-2019)
DST-SERB, New Delhi	Development of Novel, Single-Step Production of Metal Oxide Based Aligned, Electrospun Core-Shell Nanofibers and Quantitative Assessment of Their Gas Sensor Performance	56.39 lakhs	Completed (2016-2019)
TVS Motors, Hosur	Development of Oxygen Nanosensor for Automotive Applications	9.84 lakhs	Completed (2016-2018)
NPMASS-ADA, Bangalore	Development of Portable Toxic Gas Sensors Based on Hybrid Metal Nanoparticles-MWCNT Composite Nanofibers for Environmental Monitoring	49.19 lakhs	Completed (2011-2014)
IGCAR, Kalpakkam-PSGCT, Coimbatore	Development of Hybrid Core-Shell Nanoparticles Based Sensor for NO_x gas Detection for Chemical Environment and Safety Applications	24.28 lakhs	Completed (2010-2013)

Awards and Achievements

- Society for Materials Chemistry (SMC) Bronze Medal-2024 award received at BARC, Mumbai on 5th December, **2024**.
- MILIR-2024 Best Scientist award, Rathinam Group of Institutions, Coimbatore 8th March, **2024**
- Best faculty award, BE/BS program, PSG Institute of Advanced Studies, Coimbatore, **2019**.
- Best women faculty award, PSG Institute of Advanced Studies, Coimbatore, *Women's day celebrations*, PSG Institutions, 8th March, **201**7.
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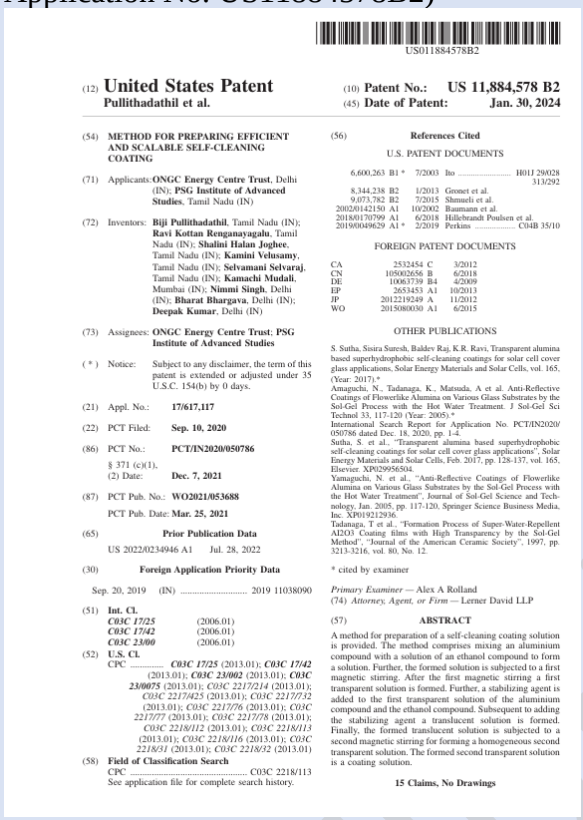
- Best Poster Award in "*International Conference on Functional Materials (FM 2008)*", IIT Madras, November 27-29, **2008**.
- Selected candidate from IITM, by the Indo-France exchange program and travel grant award for participating in the Nanotechnology hands on training program "*European School on Nanosciences and Nanotechnologies (ESSON-2007)*" at Grenoble, France in **2007**.
- Qualified National Eligibility Test (CSIR-UGC-NET) for Lectureship in **2004**.
- Awarded HTRA research fellowship for PhD programme at IIT Madras in **2004**.
- Qualified Graduate Aptitude Test in Engineering (GATE) in **2003**.

Patents

- US Patent "*A Method for Preparing Efficient and Scalable Self-Cleaning Coating*" (Joint Patent PSG Institute of Advanced Studies and ONGC Energy Centre Trust, (**Granted**, Application No. US11884578B2)



US011884578B2

(12) **United States Patent**
Pullithadathil et al.

(10) **Patent No.: US 11,884,578 B2**
(45) **Date of Patent: Jan. 30, 2024**

(54) **METHOD FOR PREPARING EFFICIENT AND SCALABLE SELF-CLEANING COATING**

(71) Applicants: **ONGC Energy Centre Trust**, Delhi (IN); **PSG Institute of Advanced Studies**, Tamil Nadu (IN)

(72) Inventors: **Biji Pullithadathil**, Tamil Nadu (IN); **Ravi Kottan Renganayagalu**, Tamil Nadu (IN); **Shalini Halan Joghee**, Tamil Nadu (IN); **Kamini Velusamy**, Tamil Nadu (IN); **Selvamani Selvaraj**, Tamil Nadu (IN); **Kamachi Mudali**, Mumbai (IN); **Nimmi Singh**, Delhi (IN); **Bharat Bhargava**, Delhi (IN); **Deepak Kumar**, Delhi (IN)

(73) Assignees: **ONGC Energy Centre Trust**; **PSG Institute of Advanced Studies**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **17/617,117**

(22) PCT Filed: **Sep. 10, 2020**

(86) PCT No.: **PCT/IN2020/050786**
§ 371 (c)(1),
(2) Date: **Dec. 7, 2021**

(87) PCT Pub. No.: **WO2021/053688**
PCT Pub. Date: **Mar. 25, 2021**

(65) **Prior Publication Data**
US 2022/0234946 A1 Jul. 28, 2022

(30) **Foreign Application Priority Data**
Sep. 20, 2019 (IN) 2019 11038090

(51) **Int. Cl.**
C03C 17/25 (2006.01)
C03C 17/42 (2006.01)
C03C 23/00 (2006.01)

(52) **U.S. Cl.**
CPC ***C03C 17/25*** (2013.01); ***C03C 17/42*** (2013.01); ***C03C 23/002*** (2013.01); ***C03C 23/0075*** (2013.01); *C03C 2217/214* (2013.01); *C03C 2217/425* (2013.01); *C03C 2217/732* (2013.01); *C03C 2217/76* (2013.01); *C03C 2217/77* (2013.01); *C03C 2217/78* (2013.01); *C03C 2218/112* (2013.01); *C03C 2218/113* (2013.01); *C03C 2218/116* (2013.01); *C03C 2218/31* (2013.01); *C03C 2218/32* (2013.01)

(58) **Field of Classification Search**
CPC C03C 2218/113
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,600,263 B1 * 7/2003 Ito H01J 29/028 313/292
8,344,238 B2 1/2013 Gronet et al.
9,073,782 B2 7/2015 Shmueli et al.
2002/0142150 A1 10/2002 Baumann et al.
2018/0170799 A1 6/2018 Hillebrandt Poulsen et al.
2019/0049629 A1 * 2/2019 Perkins C04B 35/10

FOREIGN PATENT DOCUMENTS

CA 2532454 C 3/2012
CN 105002656 B 6/2018
DE 10063739 B4 4/2009
EP 2653453 A1 10/2013
JP 2012219249 A 11/2012
WO 2015080030 A1 6/2015

OTHER PUBLICATIONS

S. Sutha, Sisira Suresh, Baldev Raj, K.R. Ravi, Transparent alumina based superhydrophobic self-cleaning coatings for solar cell cover glass applications, Solar Energy Materials and Solar Cells, vol. 165, (Year: 2017).*
Amaguchi, N., Tadanaga, K., Matsuda, A et al. Anti-Reflective Coatings of Flowerlike Alumina on Various Glass Substrates by the Sol-Gel Process with the Hot Water Treatment. J Sol-Gel Sci Technol 33, 117-120 (Year: 2005).*
International Search Report for Application No. PCT/IN2020/050786 dated Dec. 18, 2020. pp. 1-4.
Sutha, S. et al., "Transparent alumina based superhydrophobic self-cleaning coatings for solar cell cover glass applications", Solar Energy Materials and Solar Cells, Feb. 2017, pp. 128-137, vol. 165, Elsevier. XP029956504.
Yamaguchi, N. et al., "Anti-Reflective Coatings of Flowerlike Alumina on Various Glass Substrates by the Sol-Gel Process with the Hot Water Treatment", Journal of Sol-Gel Science and Technology, Jan. 2005, pp. 117-120, Springer Science Business Media, Inc. XP019212936.
Tadanaga, T et al., "Formation Process of Super-Water-Repellent Al2O3 Coating films with High Transparency by the Sol-Gel Method", "Journal of the American Ceramic Society", 1997, pp. 3213-3216, vol. 80, No. 12.

* cited by examiner

Primary Examiner — Alex A Rolland
(74) *Attorney, Agent, or Firm* — Lerner David LLP

(57) **ABSTRACT**

A method for preparation of a self-cleaning coating solution is provided. The method comprises mixing an aluminium compound with a solution of an ethanol compound to form a solution. Further, the formed solution is subjected to a first magnetic stirring. After the first magnetic stirring a first transparent solution is formed. Further, a stabilizing agent is added to the first transparent solution of the aluminium compound and the ethanol compound. Subsequent to adding the stabilizing agent a translucent solution is formed. Finally, the formed translucent solution is subjected to a second magnetic stirring for forming a homogeneous second transparent solution. The formed second transparent solution is a coating solution.

15 Claims, No Drawings

- Indian patent on "*A Method for Preparing Efficient and Scalable Self-Cleaning Coating*" (Joint Indian Patent PSG Institute of Advanced Studies and ONGC Energy Centre Trust, **Granted**, Patent No: 484583, Application No. 201911038090).

क्रम सं/Sl. No :011185794

INTELLECTUAL PROPERTY INDIA

पेटेंट कार्यालय,भारत सरकार
पेटेंट प्रमाण पत्र | The Patent Office, Government Of India
Patent Certificate
(पेटेंट नियमावली का नियम 74) (Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No. : 484583
आवेदन सं. / Application No. : 201911038090
फाइल करने की तारीख / Date of Filing : 20/09/2019
पेटेंटी / Patentee : 1.ONGC Energy Centre Trust 2.PSG Institute of Advanced Studies

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित *A METHOD FOR PREPARING EFFICIENT AND SCALABLE SELF-CLEANING COATING* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख सितम्बर 2019 के बीसवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

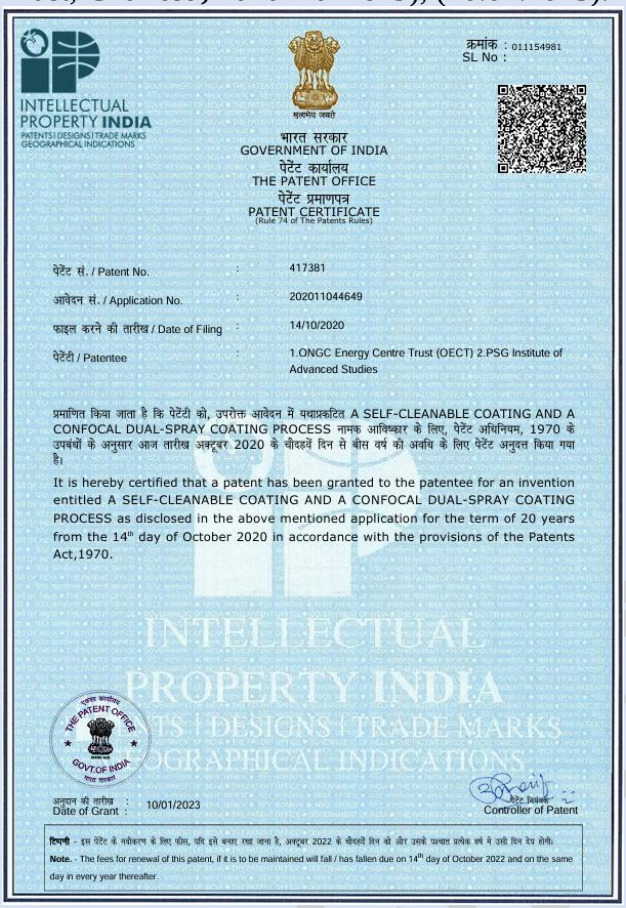
It is hereby certified that a patent has been granted to the patentee for an invention entitled *A METHOD FOR PREPARING EFFICIENT AND SCALABLE SELF-CLEANING COATING* as disclosed in the above mentioned application for the term of 20 years from the 20th day of September 2019 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख : 18/12/2023
Date of Grant :

Controller of Patents

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, सितम्बर 2021 के बीसवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।
Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 20th day of September 2021 and on the same day in every year thereafter.

- Indian patent on "*A Self-cleaning Coating Solution and a Confocal Dual-Spray Coating Process*" (Joint Indian Patent PSG Institute of Advanced Studies and ONGC Energy Centre Trust, **Granted,** 202011044649), (10.01.2023).



INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

क्रमांक : 011154981
SL No :

भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE
पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No.	:	417381
आवेदन सं. / Application No.	:	202011044649
फाइल करने की तारीख / Date of Filing	:	14/10/2020
पेटेंटी / Patentee	:	1.ONGC Energy Centre Trust (OECT) 2.PSG Institute of Advanced Studies

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित A SELF-CLEANABLE COATING AND A CONFOCAL DUAL-SPRAY COATING PROCESS नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख अक्टूबर 2020 के चौदहवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled A SELF-CLEANABLE COATING AND A CONFOCAL DUAL-SPRAY COATING PROCESS as disclosed in the above mentioned application for the term of 20 years from the 14th day of October 2020 in accordance with the provisions of the Patents Act,1970.

INTELLECTUAL PROPERTY INDIA
TS | DESIGNS | TRADE MARKS
OGRAPHICAL INDICATIONS

THE PATENT OFFICE GOVT OF INDIA

अनुदान की तारीख : 10/01/2023
Date of Grant :

Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, अक्टूबर 2022 के चौदहवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।
Note. - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 14th day of October 2022 and on the same day in every year thereafter.

- Indian patent on "*Biomass-Derived Label-Free SERS Sensor for Detection of Amyloid Beta Biomarker Detection For Alzheimer's Disease*", (**Filed,** Application no: 202441102075)
- Indian patent on "*A Microfluidic Sensor Platform for Trace Level Detection of Ammonium Ions in Water Bodies*", (**Filed,** Application no: 202441100886)

Journal Publications

2025

89. Rajesh Unnathpadi, Navami Sunil, Athira Suresh, Athul Pradeep, Irshad M. K, Divya Sreetha Murugan, Ajith Manayil Parambil, **Biji Pullithadathil***, **2025**, Label-Free SERS Detection of Pesticides Using Ag-Functionalized Black Silicon Derived from Recycled Solar Cells (**Under Revision**)

88. Gayathri Velusamy, Aleena Unnikrishnan, Dinesh Veeran Ponnuvelu, Selvakumar Rajendran, Sungsu Park, **Biji Pullithadathil***, **2025**, Analysis of Conventional and Enhanced-Biocompatibility ZnO/Ag Heterojunction Nanorod-Based Advanced Root Canal Sealers, *Bioengineering* (https://doi.org/10.3390/bioengineering12090917, **Impact Factor: 3.7**)

87. Navami Sunil, Rajesh Unnathpadi, Kottayasamy Seenivasagam Rajkumar, T Abhijith, R Latha, Sheen Shina, K Chandra Devi, **Biji Pullithadathil***, **2025**, 3D-Printed Microfluidic Integrated SERS Salivary Biosensor Utilizing Fe@Ag/Carbon Nanofibers for Advanced Machine Learning-driven Non-Invasive, Label-Free Mass Screening of Lung Cancer, *ACS*

Applied Nano Materials, 8, 31, 15558–15571 (https://doi.org/10.1021/acsanm.5c02523, **Impact Factor: 6.14**)

Seenivasagam, T Abhijith, R. Latha, Shina Sheen and **Biji Pullithadathil***, **2025**, Development of AI-Derived, Non-Invasive, Label-Free 3D-Printed Microfluidic SERS Biosensor Platform Utilizing Cu@Ag/Carbon Nanofibers for Detection of Salivary Biomarkers in Mass Screening of Oral Cancer, *Journal of Materials Chemistry B* ,13, 3405-3419 (https://doi.org/10.1039/D4TB02766C, **Impact Factor: 6.1**)

85. Ramakrishnan Vishnuraj, Thangavelu Kokulnathan, Tzyy-Jiann Wang, Murali Rangarajan, **Biji Pullithadathil, 2025,** Enhanced Electrochemical Detection of Cardio-Selective *β*-Blocker (Acebutolol) Using Coaxially Electrospun Gold Nanograins/Tin Oxide Nanofiber, *Journal of Alloys and Compounds, 1014*, 178600 (https://doi.org/10.1016/j.jallcom.2025.178600**, Impact factor: 6.2**)

84. Mahaboobbatcha Aleem, Ramakrishnan Vishnuraj, **Biji Pullithadathil***, **2025**, Recycled Silicon Solar Cells-Derived Nanostructured p-Black Silicon for High Performance NO_2 Gas Sensor Applications, *RSC Applied Interfaces*, 2, 220-229 (https://doi.org/10.1039/D4LF00299G**, Impact factor: Awaiting**)

2024

83. Navami Sunil, Ashma Shikkandar, Baby Roselin Rajan durai, Rajesh Unnathpadi, Veintramuthu Sankar and **Biji Pullithadathil***, **2024,** Label-Free Surface-Enhanced Raman Spectroscopy Detection Of Amyloid Beta On Silver Nanostructured Substrates For Alzheimer's Diagnosis, *Journal of Biophotonics*, 18(2), e202400314 (**Impact factor: 2.8**)

82. Ramakrishnan Vishnuraj, Rajesh Unnathpadi, Murali Rangarajan, **Biji Pullithadathil*, 2024**, Highly Sensitive *n*-In_2O_3@n-WO_3 Heterojunction Nanowires based NO_2 Gas Sensors for Environmental Monitoring, *Microchimica Acta*, 191, 645 (https://doi.org/10.1007/s00604-024-06693-7**, Impact factor: 5.3**)

81. Navami Sunil, Rajesh Unnathpadi and **Biji Pullithadathil*, 2024,** Ag Nanoislands Functionalized Hollow Carbon Nano Fibres as Non-Invasive SERS Salivary Biosensor Platform for Salivary Nitrite Detection for Pre-Diagnosis of Oral Cancer, *Analyst*, 149, 4443-4453 (https://doi.org/10.1039/D4AN00641K**, Impact factor: 4.2**)

80. Viswanathapuri Karunanithi Premkumar, Ramakrishnan Vishnuraj, Thankaraj Salammal Sheena, Xu Yang, **Biji Pullithadathil**, Chunfang Zhang, Zucheng Wu, **2024**, Influence of ZnO Hexagonal Pyramid Nanostructures for Highly Sensitive and Selective NO_2 Gas Sensor, *Journal of Alloys and Compounds*, 994, 174625 (https://doi.org/10.1016/j.jallcom.2024.174625, **Impact factor: 6.2)**

79. Pavithra Ponnusamy, Manoj kumar Panthalingal, Geetha Priyadarshini Badhirappan, **Biji Pullithadathil***, **2024**, Durable Electrocatalyst Support Materials based on N-doped Mesoporous Carbon Nanofibers with Titanium Nitride Overlay Coating for High-Performance PEM Fuel Cells, *ACS Applied Nano Materials*, 7, 5, 4676–4691 (https://doi.org/10.1021/acsanm.3c03997, **Impact factor: 6.140**)

78. Thangavelu Kokulnathan, Ramakrishnan Vishnuraj, Tzyy-Jiann Wang, **Biji Pullithadathil**, Murali Rangarajan, Faheem Ahmed, Thamraa Alshahrani, **2024**, Strongly coupled design of zinc oxide-nanorods/copper tin sulphide-nanoflowers nanostructures: An electrochemical study in 4-nitrochlorobenzene detection, *Chemical Engineering Journal*, 479, 147747 (https://doi.org/10.1016/j.cej.2023.147747, **Impact factor: 15.1)**

77. Suvarna K. Subrahmanian, Kavya V. Palliyal, Sowmya Balasubramanyan, Rajesh Unnathpadi, Biji Pullithadathil, Binitha N. Narayanan, **2024**, In-situ Green Gram Scale Synthesis of Carbon Sphere/Graphene for High-Performance Supercapacitors, *Nano-Structures & Nano-Objects*, 37, 101107 (https://doi.org/10.1016/j.nanoso.2024.101107, **Impact factor: Awaiting)**

2023

76. Navami Sunil, Rajesh Unnathpadi and **Biji Pullithadathil*, 2023,** Label-Free SERS Salivary Biosensor based on Bimetallic, Core-Shell Ni@Ag Plasmonic Nanoislands Anchored Carbon Nano fibres for Pre-Diagnosis of Lung Cancer, *ACS Applied Nano Materials*, 6, 13, 11334–11350 (https://doi.org/10.1021/acsanm.3c01379, **Impact factor: 6.140**)

75. Ramakrishnan Vishnuraj, Mahaboobbatcha Aleem, Keerthi G Nair, and **Biji Pullithadathil*, 2023,** 1D Aligned, n-p and n-n type ZnO Heterojunction Nanofibers for NO_2 Sensors: Exploration of Conduction Mechanism using In-situ Impedance Spectroscopy, *Materials Advances*, 4, 3010-3025 (https://doi.org/10.1039/D2MA01095J, **Impact factor: 5.36**)

74. Mahaboobbatcha Aleem, Ramakrishnan Vishnuraj, Balachander Krishnan, Anuradha Ashok and **Biji Pullithadathil***, **2023,** Narrow Line Width Ni-Cu-Sn Front Contact Metallization Patterns for Low-Cost High-Efficiency Crystalline Silicon Solar Cells Using Nano-Imprint Lithography, *Energy Technology*, 11(8), 2300090 (https://doi.org/10.1002/ente.202300090, **Impact Factor: 4.149)**

73. Mohammad Gholinejad*, Faezeh Khosravi, José, M. Sansano, Ramakrishnan Vishnuraj, **Biji Pullithadathil***, **2023**, Bimetallic AuNi Nanoparticles Supported on Mesoporous MgO as Catalyst for Sonogashira-Hagihara Cross-Coupling Reaction, *Journal of Organometallic Chemistry, 987–988, 122636* (https://doi.org/10.1016/j.jorganchem.2023.122636, **Impact Factor: 2.345**)

72. Navami Sunil, Rajesh Unnathpadi and **Biji Pullithadathil*, 2023,** Silver Anchored α-MnO_2 Nanorods Based SERS Substrates for Salivary Thiocyanate Detection and Application in Oral Cancer Diagnosis, *Journal of Biomedical Photonics & Engineering*, 9(3), 030311-7 (https://dx.doi.org/10.18287/JBPE23.09.030311, **Impact Factor: Awaiting)**

2022

71. Mohammad Gholinejad*, Rahimeh Khezri, Sara Nayeri, Ramakrishnan Vishnuraj, **Biji Pullithadathil***, **2022,** Gold nanoparticles supported on NiO and CuO: The synergistic effect toward enhanced reduction of nitroarenes and A3-coupling reaction, *Molecular Catalysis*, 530, 112601 **(**https://doi.org/10.1016/j.mcat.2022.112601, **Impact factor: 5.089).**

70. Thangavelu Kokulnathan, Ramakrishnan Vishnuraj, Tzyy-Jiann Wang, **Biji Pullithadathil**, Multidimensional nanoarchitectures of TiO_2/Au nanofibers with O-doped C_3N_4 nanosheets for electrochemical detection of nitrofurazone**, 2022**, *Applied Surface Science*, 604, 154474 **(**https://doi.org/10.1016/j.apsusc.2022.154474, **Impact factor: 7.392).**

69. Keerthi G. Nair, Ramakrishnan Vishnuraj and **Biji Pullithadathil***, **2022**, Integrated Co-axial Electrospinning for Single-Step Production of 1D Aligned Bimetallic Carbon Fibers@AuNPs-PtNPs/NiNPs-PtNPs Towards H_2 Detection, *Materials Advances*, 3, 443-455 (https://doi.org/10.1039/D1MA00683E, **Impact factor: 5.36**)

68. Thangavelu Kokulnathan, Ramakrishnan Vishnuraj, Tzyy-Jiann Wang, **Biji Pullithadathil, 2022**, Tailored Construction of One-Dimensional TiO_2/Au Nanofibers: Validation of an Analytical Assay for Detection of Diphenylamine in Food Samples, *Food Chemistry* 380, 132052 (https://doi.org/10.1016/j.foodchem.2022.132052, **Impact factor: 9.231)**

67. Ramakrishnan Vishnuraj, Rajesh Unnathpadi, **Biji Pullithadathil***, **2022,** *p*-Co_3O_4 supported heterojunction Carbon Nanofibers for Ammonia gas sensor applications, *J. Mater. NanoSci*., 9(1), 61-67 (https://pubs.thesciencein.org/journal/index.php/jmns/article/view/289, **ISSN: 2394-0867)**

2021

66. A. Mahaboobatcha, Ramakrishnan Vishnuraj, Balachander Krishnan and **Biji Pullithadathil*, 2021,** Realization of Micropatterned, Narrow Line-width Ni-Cu-Sn Front Contact Grid Pattern using Mask-less Direct-write Lithography for Industrial Silicon Solar Cells, *ACS Applied Energy Materials*, 4, 10, 10682–10696 (https://doi.org/10.1021/acsaem.1c01699, **Impact factor: 6.959**)

65. Shalini Hallan, U. Kamachi Mudali, Nimmi Singh, Sajeev Katti, Peeyush Kumar, Maninder Pal Kaur and **Biji Pullithadathil***, **2021**, Omnidirectional Antireflective Subwavelength *r*-AlOOH Hierarchical Nanostructures with Controlled Graded Index Profile to Enhance Optical Transmission and Self-cleaning Performance, *Langmuir*, 37, 23, 6953–6966 (https://doi.org/10.1021/acs.langmuir.1c00462, **Impact factor: 4.331)**

64. Keerthi G Nair, Ramakrishnan Vishnuraj and **Biji Pullithadathil*, 2021,** Highly Sensitive, Flexible H_2 Gas Sensor based on Less-Platinum Bimetallic Ni-Pt nanoparticles Functionalized Carbon Nanofibers, *ACS Applied Electronic Materials*, 3, 4, 1621–1633 (https://doi.org/10.1021/acsaelm.0c01103, **Impact factor: 4.494)**.

63. Ramakrishnan Vishnuraj, Jayaseelan Dhakshinamoorthy, Keerthi G Nair, Mahaboobbatcha Aleem and **Biji Pullithadathil***, **2021**, MEMS-Compatible, Aligned ZnO@Au Heterojunction Nanofibers using In-situ Coaxial Electrospinning Strategy: Unveiling NO_2 Sensing Mechanism with Operando Photoluminescence Studies, *Materials Advances*, 2, 3000-3013 (https://doi.org/10.1039/D1MA00094B, **Impact factor: 5.36**)

62. Vijayasree Haridas, A. Sukhananazerin, **Biji Pullithadathil**, Binitha N. Narayanan, **2021**, Ultrahigh Specific Capacitance of α-Fe_2O_3 Nanorods-Incorporated Defect-Free Graphene Nanolayers, *Energy*, 221, 119743 **(**https://doi.org/10.1016/j.energy.2020.119743, **Impact factor: 8.857)**.

2020

61. Jayaseelan Dhakshinamoorthy, Sachin Kumar Srivastava, Durgamadhab Mishra and **Biji Pullithadathil*, 2020**, Unveiling the Interplay between Induced Native Defects and Room Temperature Magnetic Ordering in Titanium Deficient Disordered-TiO_2 Nanoparticles, *Nanotechnology*, 32(9), 095701 **(**https://doi.org/10.1088/1361-6528/abc57b, **Impact factor: 3.953)**.

60. Siddhita A. Jadhav, **Pullithadathil Biji**, Manoj Kumar Panthalingal, Murali Krishna C Rajkumar S, Dattatraya S. Joshi, Natarajan Sundaram, **2020**, Development of integrated microfluidic platform coupled with Surface-enhanced Raman Spectroscopy for diagnosis of COVID-19, *Medical Hypotheses*, 110356 **(**https://doi.org/10.1016/j.mehy.2020.110356, **Impact factor: 4.411)**.

59. Shalini Hallan, U. Kamachi Mudali, Nimmi Singh, Sajeev Katti, Peeyush Kumar, K. R. Ravi and **Biji Pullithadathil***, **2020**, Superhydrophobic Coatings Based on Pseudoboehmite Nanoflakelets for Sustainable Photovoltaic Energy Production, *ACS Applied Nano Materials*, 3(10), 9899–9911 **(**https://doi.org/10.1021/acsanm.0c01956, **Impact factor: 6.140)**

58. A. Sukhananazerin and **Biji Pullithadathil*, 2020,** Unidirectional Langmuir-Blodgett-Mediated Alignment of Polyaniline-Functionalized Multiwalled Carbon Nanotubes for NH_3 Gas Sensing applications, *Langmuir*, 36(39), 11618–11628. **(**https://doi.org/10.1021/acs.langmuir.0c02200, **Impact factor: 4.331)**

57. Thangavelu Kokulnathan, Ramakrishnan Vishnuraj, Elumalai Ashok Kumar, Tzyy-Jiann Wang, **Biji Pullithadathil, 2020,** Heterostructured Boron Nitride Decorated Bismuth Oxide Nanocomposite Based Electrochemical Platform for Determination of Flutamide in Environmental Samples, *Ecotoxicology and Environmental Safety*, 207, 111276. **(**https://doi.org/10.1016/j.ecoenv.2020.111276, **Impact factor: 7.129)**

56. R. Vishnuraj, K. K. Karthikeyan, A. Mahaboobbatcha and **Biji Pullithadathil***, **2020**, Boosting Performance of NO_2 Gas Sensor based on *n-n* Type Mesoporous ZnO@In_2O_3

Heterojunction Nanowires: *In-situ* Conducting Probe Atomic Force Microscopic Elucidation of Room Temperature, Localized Electron Transfer, *Nanoscale Advances*, 2, 4785-4797 **(**https://doi.org/10.1039/D0NA00318B**, Impact factor: 5.598)**

55. Dinesh V Ponnuvelu, Jayaseelan Dhakshinamoorthy, Arun K. Prasad, Dhara Kumar Sandip, Kamruddin Mohammed, **Biji Pullithadathil*, 2020**, Geometrically Controlled Au Decorated ZnO Heterojunction Nanostructures for NO_2 Detection, *ACS Applied Nano Materials*, 3(6), 5898–5909. **(**https://doi.org/10.1021/acsanm.0c01053, **Impact factor: 6.140)**

54. Shalini Hallan, U. Kamachi Mudali, Nimmi Singh, Sajeev Katti, Peeyush Kumar, K. R. Ravi and **Biji Pullithadathil***, **2020**, Evolution of Temperature-Driven Interfacial Wettability and Surface Energy Properties on Hierarchically-Structured Porous Superhydrophobic *pseudo*-Boehmite Thin Films, *Langmuir*, 36, 23, 6352–6364. **(**https://doi.org/10.1021/acs.langmuir.0c00368, **Impact factor: 4.331)**

53. Vijayasree Haridas, A. Sukhananazerin, J. Mary Sneha, **Biji Pullithadathil** and Binitha Narayanan., **2020,** α-Fe_2O_3 loaded less-defective graphene sheets as chemiresistive gas sensor for selective sensing of NH_3, *Applied Surface Science*, 517, 146158. **(**https://doi.org/10.1016/j.apsusc.2020.146158, **Impact factor: 7.392)**

52. Keerthi G Nair, R. Vishnuraj, U. P. Rajesh, K. K. Karthikeyan and **Biji Pullithadathil***, **2020**, Unraveling Hydrogen Adsorption Kinetics of Bimetallic Au-Pt nanoislands Functionalized Carbon Nanofibers for Room Temperature Gas Sensor Applications, *Journal of Physical Chemistry C*, 124(13), 7144-7155. **(**https://doi.org/10.1021/acs.jpcc.9b11147, **Impact factor: 4.1262)**

51. R. Vishnuraj, Keerthi G Nair, D. Jayaseelan, K. R. Ravi and **Biji Pullithadathil***, **2020**, Porous, *n-p* Type Ultra-long, ZnO@Bi_2O_3 Heterojunction Nanorods based NO_2 Gas Sensor: New insights towards Charge Transport Characteristics, *Physical Chemistry Chemical Physics*, 22, 7524-7536. **(**https://doi.org/10.1039/D0CP00567C, **Impact factor: 3.945)**

2019

50. Appu V. R., Karthikeyan K K. and **Biji Pullithadathil*, 2019,** Highly Surface Active Phosphorous Doped Onion-like Carbon Nanostructures: Ultrasensitive, Fully Reversible and Portable NH_3 Gas Sensors, *ACS Applied Electronic Materials*, 1(11), 2208-2219. **(**https://doi.org/10.1021/acsaelm.9b00412, **Impact factor: 4.494)**

49. A. Mahaboobatcha, Karthikeyan K. Karuppanan, Appu Vengattoor Raghu, S. Nijil, Balachander Krishnan and **Biji Pullithadathil*, 2019,** Optimal Design of Narrow Line-width Front Contact Grid Pattern for Silicon Solar Cells and Low-Cost Fabrication of Electroless Nickel Plated Imprint Lithography Hard Stamp, *Advanced Engineering Materials*, 21(12), 1900734. **(**https://doi.org/10.1002/adem.201900734, **Impact factor: 4.122)**

48. A Sukhananazerin, Jayaseelan Dhakshinamoorthy, Vijay Mohan, Dinesh Veeran Ponnuvelu, Venkataraman Krishnan Kallidaikuruchi, Lazar Mathew Thalakkottur, **Biji Pullithadathil*, 2019**, Development of low-cost hybrid-MWCNTs based ammonia gas sensing strips with integrated sensor read-out system for clinical breath analyzer applications, *Journal of Breath Research*, 13(4), 046005. **(**https://doi.org/10.1088/1752-7163/ab278b, **Impact factor: 4.538)**

47. Appu Vengattoor Raghu, Karthikeyan K Karuppanan and **Biji Pullithadathil***, **2019,** Controlled Carbon Doping in Anatase TiO_2 (101) Facets: Superior Trace-level Ethanol Gas Sensor Performance and Adsorption Kinetics, *Advanced Materials Interfaces*, 6(4), 1801714. **(**https://doi.org/10.1002/admi.201801714, **Impact factor: 6.389)**

46. Appu Vengattoor Raghu, Karthikeyan K Karuppanan, Jayakrishnan Nampoothiri, **Biji Pullithadathil***, **2019**, Wearable, Flexible Ethanol Gas Sensor Based on TiO_2 Nanoparticles-Grafted 2D-Titanium Carbide Nanosheets, *ACS Applied Nano Materials*, 2(3), 1152–1163. **(**https://doi.org/10.1021/acsanm.8b01975, **Impact factor: 6.140)**

45. Karthikeyan K Karuppanan, Appu Vengattoor Raghu, Manoj Kumar Panthalingal, Vijayaraghavan Thiruvenkatam, Karthikeyan P and **Biji Pullithadathil***, **2019**, 3D-Porous Electrocatalytic Foam Based on Pt@N-Doped Graphene for High Performance and Durable Polymer Electrolyte Membrane Fuel Cells, *Sustainable Energy & Fuels*, 3(4), 996-1011. **(**https://doi.org/10.1039/C8SE00552D, **Impact factor: 6.813)**

44. Karthikeyan K Karuppanan, Appu Vengattoor Raghu, Manoj Kumar Panthalingal and **Biji Pullithadathil***, **2019**, Tailored Hollow Core/Mesoporous Shell Carbon Nanofibers as Highly Efficient and Durable Cathode Catalyst Supports for Polymer Electrolyte Fuel Cells, *ChemElectroChem*, 6, 2029 –2042. **(**https://doi.org/10.1002/celc.201900065, **Impact factor: 4.782)**

43. V. P. Dinesh, R. Sriram kumar, A. Sukhananazerin, J. Mary Sneha, Manoj Kumar Panthalingal and **Biji Pullithadathil*, 2019**, Novel Stainless Steel Based, Eco-Friendly Dye-Sensitized Solar Cells Using Electrospun Porous ZnO Nanofibers, *Nano-Structures & Nano-Objects*, 19, 100311. **(**https://doi.org/10.1016/j.nanoso.2019.100311, **Impact factor: Awaited (Elsevier), ISSN: 2352-507X)**

2018

42. Jayaseelan Dhakshinamoorthy, Arun K. Prasad, Dhara Sandip and **Biji Pullithadathil*, 2018**, Anomalous Effects of Lattice Strain and Ti^{3+} Interstitials on Room-Temperature Magnetic Ordering in Defect Engineered Nano-TiO_2, *Journal of Physical Chemistry C*, 122(48), 27782–27794. **(**https://doi.org/10.1021/acs.jpcc.8b09851, **Impact factor: 4.177)**

41. Appu Vengattoor Raghu, Karthikeyan K Karuppanan and **Biji Pullithadathil***, **2018,** Highly Sensitive, Temperature-Independent Oxygen Gas Sensor based on Anatase TiO_2 Nanoparticles-grafted, 2D Mixed Valent VO_x Nanoflakelets, *ACS Sensors*, 3(9), 1811–1821. **(**https://doi.org/10.1021/acssensors.8b00544**, Impact factor: 9.618)**

40. Karthikeyan K Karuppanan, Appu V Raghu, Manoj Kumar Panthalingal, Sivasubramaniam Ramanathan, Thanarajan Kumaresan and **Biji Pullithadathil***, **2018**, Triple Phase Boundary Augmentation in Hierarchical, Pt grafted N-doped Mesoporous Carbon Nanofibers for High Performance and Durable PEM Fuel Cells, *Journal of Material Chemistry A*, 6, 12768–12781. **(**https://doi.org/10.1039/C8TA02391C, **Impact factor: 14.511)**

39. Mohammad Gholinejad, Maedeh Bahrami, Carmen Nájera, **Biji Pullithadathil**, **2018**, Magnesium Oxide Supported Bimetallic Pd/Cu Nanoparticles as an Efficient Catalyst for Sonogashira Reaction, *Journal of Catalysis*, 363, 81–91. **(**https://doi.org/10.1016/j.jcat.2018.02.028, **Impact factor: 8.047)**

38. Dinesh Veeran Ponnuvelu, Sukhananazerin Abdulla and **Biji Pullithadathil*, 2018,** Novel electro-spun nanograined ZnO/Au heterojunction nanofibers and their ultrasensitive NO_2 gas sensing properties, https://doi.org/10.1002/slct.201800103, *ChemistrySelect*, 3, 7156–7163. **(Impact factor: 2.307)**

37. Kalasapurayil Kunhiraman Aruna, Ramanathan Sivasubramanian, **Pullithadathil Biji**, **2018**, Enlarged Interlayer Spaced Molybdenum Disulfide Supported on Nanocarbon Hybrid Network for Efficient Hydrogen Evolution Reaction, *Electrochimica Acta*, 264, 329-340. **(**https://doi.org/10.1016/j.electacta.2018.01.135, **Impact factor: 7.336)**

36. V. P. Dinesh, A. Sukhananazerin and **P. Biji***, **2018**, Highly Monodispersed Porous, Heterojunction ZnO@Au Nanospheres for Trace-level Detection of NO_2 gas, *Microporous and Mesoporous Materials*, 255, 156-165. **(**https://doi.org/10.1016/j.micromeso.2017.07.022, **Impact factor: 5.876)**

2017

35. V. P. Dinesh, **P. Biji***, Arun K Prasad, Sandip Dhara, Kamruddin Mohamed, Ashok Kumar Tyagi and Baldev Raj, **2017**, Highly Sensitive, Atmospheric Pressure Operatable Sensor based

on Au Nanoclusters Decorated, Heterojunction TiO_2 Nanorods for Trace Level NO_2 Gas Detection, *Journal of Materials Science: Materials in Electronics*, 28(13), 9738–9748. (https://doi.org/10.1007/s10854-017-6725-9, **Impact factor: 2.779)**

34. V. P. Dinesh, A. Sukhananazerin and **P. Biji***, **2017**, An Emphatic Study on Role of Spill-over Sensitization and Surface Defects on NO_2 Gas Sensor Properties of Ultra-long, Core-shell, Heterojunction ZnO@Au Nanorods, *Journal of Alloys and Compounds*, 712, 811-821. **(**https://doi.org/10.1016/j.jallcom.2017.04.123, **Impact factor: 6.371)**

33. A. Sukhananazerin, V. P. Dinesh and **P. Biji***, **2017**, Rapid, Trace-Level Ammonia Gas Sensor based on Surface-Engineered Ag Nanoclusters@Polyaniline/Multiwalled Carbon Nanotubes and Insights into their Mechanistic Pathways, *ChemistrySelect*, 2(15), 4277–4289. **(**https://doi.org/10.1002/slct.201700459, **Impact factor: 2.307)**

32. Sutha Senthil, K R Ravi, **P Biji**, Baldev Raj, **2017**, Self-Cleaning Coating for Solar Panel Applications, *The Masterbuilder*, 19(3), 72-76 (http://eprints.nias.res.in/id/eprint/1270).

2016

31. D. Jayaseelan, **P. Biji***, **2016**, New insights towards electron transport mechanism of highly efficient *p*-type CuO (111) nanocuboids based H_2S gas sensor, *Journal of Physical Chemistry C*, 120(7), 4087–4096. **(**https://doi.org/10.1021/acs.jpcc.5b11327**, Impact factor: 4.177)**

30. K. K. Karthikeyan and **P. Biji***, **2016**, A Novel Biphasic Approach for Thermally Induced, Direct Synthesis of Highly Porous, Flexible Carbon Nanofiber Mats from Polyacrylonitrile (PAN)/$NaHCO_3$ Nanocomposite, *Microporous and Mesoporous Materials*, 224, 372-383. **(**https://doi.org/10.1016/j.micromeso.2015.12.055, **Impact factor: 5.876)**

29. Mohammad Gholinejad, Fariba Saadati, Shahram Shaybanizadeh, **P. Biji, 2016,** Copper Nanoparticles Supported on Starch Micro Particles as a Degradable Heterogeneous Catalyst for Three-Component Coupling Synthesis of Propargylamines, *RSC Advances*, 6, 4983-4991. **(**https://doi.org/10.1039/C5RA22292C, **Impact factor: 4.036)**

28. R. Sivasubramanian and **P. Biji, 2016**, Preparation of Copper (I) Oxide Nanohexagon Decorated reduced Graphene Oxide Nanocomposite and their Application in Electrochemical Sensing of Dopamine, *Materials Science and Engineering B*, 210, 10-18. **(**https://doi.org/10.1016/j.mseb.2016.04.018, **Impact factor: 3.407)**

27. Gholinejad, Neda Jeddi, **Biji Pullithadathil, 2016,** Agarose Functionalized Phosphorous Ligand for Stabilization of Palladium and Copper Nanoparticles as an Efficient Catalyst for Sonogashira Reaction under Mild Conditions, *Tetrahedron*, 72(19), 2491–2500. **(**https://doi.org/10.1016/j.tet.2016.03.085, **Impact factor: 2.388)**

26. Mohammad Gholinejad, Mehran Razeghi, Arash Ghaderi, **P. Biji**, **2016**, Palladium Supported on Phosphinite Functionalized Fe_3O_4 Nanoparticles as a New Magnetically Separable Catalyst for Suzuki-Miyaura Coupling Reaction in Aqueous Media, *Catalysis Science & Technology*, 6, 3117-3127. **(**https://doi.org/10.1039/C5CY00821B**, Impact factor: 6.177)**

25. V. P. Dinesh, S. Aravind, S. P. Suryaraj, R. Selvakumar and **P. Biji***, **2016,** Ultrathin hexagonal MgO nanoflakes coated medical textiles and their enhanced antibacterial activity, *Materials Research Express*. **(**https://doi.org/10.1088/2053-1591/3/10/105005, **Impact factor: 2.025)**

24. V. Elakkiya, Mridula P. Menon, D. Nataraj, **P. Biji**, R. Selvakumar, **2016**, Optical Detection of CA 15.3 Breast Cancer Antigen using CdS Quantum Dot, *IET Nanobiotechnology* 11(3), 268 – 276. **(**https://doi.org/10.1049/iet-nbt.2016.0012**, Impact factor: 2.050)**

2015

23. A. Sukhananazerin, T. Lazar Mathew and **Biji Pullithadathil***, **2015**, Highly Sensitive, Room Temperature Gas Sensor based on Polyaniline-Multiwalled Carbon Nanotubes

(PANI/MWCNTs) Nanocomposite for Trace-Level Ammonia Detection, *Sensors & Actuators B: Chemical*, 221, 1523-1534. **(**https://doi.org/10.1016/j.snb.2015.08.002, **Impact factor: 9.221)**

22. Keerthi G. Nair, D. Jayaseelan and **P. Biji*, 2015**, Direct-Writing of Circuit Interconnects on Cellulose Paper using Ultra-Long, Silver Nanowires based Conducting Ink, *RSC Advances* 5, 76092–76100. **(**https://doi.org/10.1039/C5RA10837C, **Impact factor: 4.036)**

21. Baraneedharan. P, Imran Hussain. S, Dinesh. V. P, Siva. C, **Biji. P**, Sivakumar. M, **2015**, Lattice doped Zn–SnO_2 nanospheres: A systematic exploration of dopant ion effects on structural, optical, and enhanced gas sensing properties, *Applied Surface Science*, 357, 1511–1521. **(**https://doi.org/10.1016/j.apsusc.2015.09.257**, Impact factor: 7.392)**

20. V. P. Dinesh, **P. Biji***, Arun K. Prasad, Anuradha Ashok, S. K. Dhara, M. Kamruddin, A. K. Tyagi, and Baldev Raj, **2015**, Rapid Synthesis and Characterization of Novel Hybrid ZnO@Au Core-Shell Nanorods for High Performance, Low Temperature NO_2 gas sensor Applications, *Applied Surface Science*, 355(15), 726–735. **(**https://doi.org/10.1016/j.apsusc.2015.07.143, **Impact factor: 7.392)**

19. Mohammad Gholinejad, Fatemeh Hamed, **Biji Pullithadathil*, 2015**, Novel Polymer Containing Phosphinite-Nitrogen Ligands for Stabilization of Palladium Nanoparticles: Efficient and Recyclable Catalyst for Suzuki and Sonogashira Reactions in Neat Water, *Dalton Transactions*, 44, 14293-14303. **(**https://doi.org/10.1039/C5DT01642H, **Impact factor: 4.569)**

18. G. R. Rakesh, G. S. Ranjit, K. K. Karthikeyan, P. Radhakrishnan, **P. Biji*, 2015,** A Facile Route for Controlled Alignment of Carbon Nanotube-Reinforced, Electrospun Nanofibers using Slotted Collector Plates, *eXPRESS Polymer Letters*, 9(2), 105–118. **(**10.3144/expresspolymlett.2015.12, **Impact factor: 3.952)**

17. T. L. Mathew, P. Prabhahari, A. Sukhana Nazerin and **P. Biji***, **2015**, Technologies for Clinical Diagnosis using Expired human breath analysis, *Diagnostics*, 5, 27-60. **(**https://doi.org/10.3390/diagnostics5010027, **Impact factor: 3.992)**

16. V. P. Dinesh, S. P. Suriyaraj, T. Vijayaraghavan, R. Selvakumar, **P. Biji*, 2015**, Enhanced Cell-Wall Damage Mediated, Antibacterial Activity of Core-Shell ZnO@Ag Heterojunction Nanorods against *Staphylococcus aureus* and *Pseudomonas aeruginosa*, *Journal of Material Science: Materials in Medicine*, 26(7), 204. **(**https://doi.org/10.1007/s10856-015-5535-y, **Impact factor: 4.727)**

15. D. Jayaseelan, **P. Biji***, **2015**, Finite Element Analysis of *in-situ* Alignment of Nanoparticles in Polymeric Nanofibers using Magnetic Field Assisted Electrospinning, *Materials Research Express*, 2, 095014. **(**https://doi.org/10.1088/2053-1591/2/9/095014, **Impact factor: 2.025)**

14. A. Sukhananazerin, D. Jayaseelan, V. P. Dinesh and **P. Biji***, **2015,** Controlled Fabrication of Highly Monodispersed, Gold Nanoparticles Grafted Polyaniline (Au@PANI) Nanospheres and their Efficient Ammonia Gas Sensing Properties, *Journal of Biosensors and Bioelectronics*, 6(2), 165 **(DOI: 10.4172/2155-6210.1000165, ISSN: 2155-6210)**

13. V. P. Dinesh, **P. Biji*, 2015**, Highly sensitive, graphene oxide supported zinc stannate (Zn_2SnO_4) nanocubes and their room temperature NO_2 gas sensor properties, 2015 IEEE SENSORS, 1-4 (https://doi.org/10.1109/ICSENS.2015.7370359, **ISBN:978-1-4799-8203-5)**

2014

12. V. P. Dinesh, **P. Biji***, Anuradha Ashok, S. K. Dhara, M. Kamruddin, A. K. Tyagi and Baldev Raj, **2014**, Plasmon -Mediated Highly Enhanced Photocatalytic Degradation of Industrial Textile Dyes using Hybrid ZnO@Ag Core-shell Nanorods, *RSC Advances*, 4(103), 58930-58940. **(**https://doi.org/10.1039/C4RA09405K, **Impact factor: 4.036)**

11. S. P. Suriyaraj, T. Vijayaraghavan, **P. Biji***, R. Selvakumar, **2014**, Adsorption of fluoride from aqueous solution using different phases of microbially synthesized TiO_2 nanoparticles, *Journal of Environmental Chemical Engineering*, 2(1), 444–454 **(**https://doi.org/10.1016/j.jece.2014.01.013, **Impact factor: 7.968)**

10. S. P. Suriyaraj, M. Benasir Begam, S. G. Deepika, **P. Biji**, R. Selvakumar, **2014**, Photocatalytic removal of nitrate using TiO_2/PAN nanofiber membrane synthesized by co-electrospinning process, *Water Science and Technology: Water supply*, 14(4), 554-560. **(**https://doi.org/10.2166/ws.2014.007, **Impact factor: 1.768)**

2013

9. V.P. Dinesh, **P. Biji***, A. K. Prasad, A. K. Tyagi, **2013**, Enhanced ammonia sensing properties using Au decorated ZnO nanorods, *Sensors, 2013 IEEE*, 1-4. **(**https://doi.org/10.1109/ICSENS.2013.6688189**, Impact factor: 3.076)**

8. S.Prasanna, G.Krishnendu, S.Shalini, **P.Biji**, G.Mohan Rao, S.Jayakumar, R. Balasundaraprabhu, **2013**. Composition, structure and electrical properties of DC reactive magnetron sputtered Al_2O_3 thin films, *Materials Science in Semiconductor Processing*, 16(3), 705–711. **(**https://doi.org/10.1016/j.mssp.2012.12.012, **Impact factor: 4.644)**

7. S.Prasanna, **P.Biji**, G.Mohan Rao, M.D.Kannan, S.Jayakumar, **2013**. Deposition and Characterization of Nanocrystalline Al_2O_3 Thin Films by DC Reactive Magnetron Sputtering, *Advanced Materials Research, 678*, 149-153. **(**https://doi.org/10.4028/www.scientific.net/AMR.678.149, **ISSN: 1662-8985)**

2012

6. V.P.Dinesh, **P.Biji**, M.Kumaravel, A.K.Tyagi and M.Kamaruddin, **2012**, Synthesis and Characterization of Hybrid ZnO@Ag Core-Shell Nanospheres for Gas Sensor Applications, *Materials Science Forum, 710*, 768-773. **(**https://doi.org/10.4028/www.scientific.net/MSF.710.768, **ISSN: 1662-975)**

5. Biji.P and A.Patnaik. **2012**. Surface Confined Crown Ether-Capped Gold Nanoclusters: Investigation on Their Electrochemical Behavior, *Journal of Nanoparticle Research*, 14, 1005-1015 **(**https://doi.org/10.1007/s11051-012-1005-3, **Impact factor: 2.533)**

4. **Biji.P** and A.Patnaik. **2012**. Interfacial Janus Gold Nanoclusters as Excellent Phase and Orientation-specific Dopamine Sensors, *Analyst*, 137(20), 4795-4801 **(**https://doi.org/10.1039/C2AN35964B, **Impact factor: 5.227)**

2010

3. **Biji.P,** N.K.Sarangi, and A.Patnaik, **2010**, One Pot Hemi-micellar Synthesis of Amphiphilic Janus Gold Nanoclusters for Novel Electronic Attributes, *Langmuir*, 26(17), 14047-14057 **(**https://doi.org/10.1021/la102371v, **Impact factor: 4.331)**

2008

2. Rajesh.K, Shajesh.P, **Biji.P,** Warrier.K.G. **2008**. High surface area mesoporous nanocrystalline lanthanum phosphate nanorod through a sol–gel process–Effect of alcohol washing on a non-oxide gel. *Microporous and Mesoporous Materials*, *116(1-3)*, 693-697. **(**https://doi.org/10.1016/j.micromeso.2008.06.012, **Impact factor: 5.876)**

2007

1. **Biji. P** and A. Patnaik. **2007.** Novel Crown Ether-Capped Cationic Gold Nanoclusters in Aqueous Medium and their Single Electron Charging Features, *Langmuir*, *23(24)*, 12048-12054. **(**https://doi.org/10.1021/la701636h, **Impact factor: 4.331)**

Books/Book Chapters Published

1. Rajesh Unnathpadi, Navami Sunil, **Biji Pullithadathil***, Book Chapter on "*Enhancing the Sensitivity of Contaminant Detection: Surface-Enhanced Raman Spectroscopy (SERS) with Carbon Nanomaterials*", in "Carbon: Bulk-to-Nano Forms for Detection and Remediation of Environmental Contaminants", **Springer Nature**, Edited by Ajith Manayil Parambil, Eepsita Priyadarshini, Paulraj Rajamani, (**2025**) (**ISBN: 978-3-031-90613-8**)
2. Keerthi G. Nair and **P. Biji**, Book chapter (7) on "*Carbon Nanomaterials for Hydrogen Gas Sensing Applications*" in "Carbon Composites Composites with Nanotubes, Nanomaterials, and Graphene Oxide" **CRC Press**, edited by Eduardo A. Castro, Ann Rose Abraham and A. K. Haghi (**2023**) (**ISBN: 9781774912492**)
3. Navami Sunil and **Biji Pullithadathil***, Book chapter on "*Non-Invasive Biomarker Sensors using Surface Enhanced Raman Spectroscopy*" in "Nanomaterials for Sensing and Optoelectronic Applications" **Elsevier**, edited by M K Jayaraj **(2022)** (**ISBN: 978-0-12-824008-3**).
4. Pavithra Ponnusamy, Manoj Kumar Panthalingal and **Biji Pullithadathil***, Book chapter (12) on **"***Technological Risks and Durability Issues for the PEMFC Technology" in "*PEMFC technology to PEM Fuel Cells: Fundamentals, Advanced Technologies, and Practical Application*",* **Elsevier**, edited by Gurbinder Kaur, **(2021)** (**ISBN: 9780128237090**).
5. Shalini Halan Joghee, Navami Sunil, Gokul Selvaraj, Kamachi Mudali U and **Biji Pullithadathil***, Book chapter on "*Bio-Inspired Multi-functional Superhydrophobic Coatings for Corrosion Resistance*" in "A Treatise in Corrosion Science, Engineering, Technology and Management: Perspectives & Strategies" **Springer**, edited by U. Kamachi Mudali, **(2021) (ISBN: 9789811693014)**
6. Keerthi G. Nair, Dinesh V. P and **Biji P***, Book chapter (9) on "*Metal Oxide Based Heterojunction Nanoscale Materials for Chemiresistive Gas Sensors*" in "Advances in Nanostructured Composites" Vol. 2., **CRC Press**, Taylor & Francis, USA edited by Mahmood Aliofkhazraei, **(2019) (ISBN 9780367076313).**
7. Karthikeyan K. K, Manoj Kumar P and **Biji P***, Book Chapter (26) on "*Nano-scale, Catalyst Support Materials for Proton Exchange Membrane Fuel Cells",* in "Handbook of Nanomaterials for Industrial Applications", **Elsevier**, edited by Hussain, Chaudhery Mustansar **(2018) (ISBN 978-0-12-813351-4)**

Technology transfer

- "Large area superhydrophobic self-cleaning coatings for PV and non-PV applications" to ONGC Energy Center, New Delhi

Products/Prototypes Developed

- PEM fuel cell stack
- AEM electrolyzer for sea water electrolysis
- Large area superhydrophobic self-cleaning coatings
- 3D printed SERS biosensor for oral/lung cancer diagnosis
- Gas sensors (H_2, NO_2, NH_3, O_2, Acetone)
- Clinical breath ammonia analyzer
- Microfluidic ammonium ion sensor platform for water quality monitoring
- Silver-less (Ni-Cu-Sn) front-contact metallization pattern for solar cells
- Conducting graphene nanoink

Consultancy Projects

Ongoing

- PDLC coating - fabrication and characterization –DNxt Ideas India Pvt. Ltd.
- Graphene-based conductive ink development and characterization – Alohatech Ventures Pvt. Ltd.
- Catalytic overlayered sensors for early detection of battery thermal runaways – IIT Palakkad-IMPACT

Completed

- Development of Oxygen Nanosensor for Automotive Applications (TVS Motors, Hosur)

Laboratories In-charge

1. Nanoscnsors & Clean Energy Laboratory
2. Large Area Coatings Laboratory
3. Green Hydrogen and Fuel Cell Laboratory
4. Multimode Scanning Probe Microscopy Facility
5. Confocal Raman Microscopy Facility

Invited Talks

a. Invited Talk, Engineering Carbon Architectures to Boost Performance and Durability of PEM Fuel Cell Catalysts" during *National Symposium on Electrochemical Science and Technology (NSEST-2025)* held on August 28–29, 2025 organized by The Electrochemical Society of India (ECSI), IISc Bangalore at SRM Institute of Science and Technology (SRMIST), Kattankulathur.

b. Plenary Talk, Engineering Carbon-Based Electrocatalyst Supports for Enhanced Durability and Performance in PEM Fuel Cells, delivered during *International Conference on Clean Energy and Environment for Sustainable Future (ICEESF-2025),* held on August 22–23, **2025**, organized by Mar Athanasius College, Kothamangalam, Kerala.

c. Guest Lecture, Nano-Engineered Surfaces and Interfaces for Clean Energy and Sensor Applications, on 21st February, **2025**, Department of Chemistry, University of Pretoria, South Africa.

d. Invited Talk, Durable Electrocatalyst Support Materials based on N-doped Mesoporous Carbon Nanofibers for High-Performance PEM Fuel Cells, delivered on 29th January, **2025** during *International Conference on Energy Conversion and Storage (IECS-2025),* 27-29th January, **2025** organized by IIT Madras.

e. Invited Talk, Nano-engineered, Large Area Superhydrophobic, Self-cleaning Coatings for Solar Panels, *DAE-BRNS 10th Interdisciplinary Symposium on Materials Chemistry (ISMC-2024)* jointly organized by and SMC at BARC, Mumbai during 4-7th December, **2024**.

f. Invited talk, Advanced Carbon based Electrocatalyst Support Materials for Durable Proton Exchange Membrane Fuel Cells delivered on 24th October **2024** during the Two Weeks *Faculty Development Programme on "Emerging Trends in Electrochemical Energy Storage and Conversion Devices*" conducted during 14th to 25th October 2024 organized by Coimbatore Institute of Technology and Govt College of Technology, Coimbatore.

g. Invited talk, Advanced Carbon based Electrocatalyst Support Materials for Durable Proton Exchange Membrane Fuel Cells in "*International Conference on Advanced Energy Materials for a Sustainable Future (ICAEMS 2024)*" organized by Department of Science & Humanities at the Federal Institute of Science and Technology (FISAT), Angamaly, Kochi, Kerala on 23rd August, **2024**.
h. Invited Talk, Nano-Engineered Surfaces and Interfaces for Sensors and Energy Applications in One Day Thematic Meet on *"The Many Faces of Colloids & Interfaces*" at Department of Chemistry, IIT Madras on 15th June, **2024**.
i. Invited talk, Label-Free SERS Salivary Biosensor Platforms based on Electrospun Carbon Nanofibres for Pre-Diagnosis of Lung Cancer, *Asia-Pacific Engineering Healthcare Conclave* at Radisson Blu, Mysore organized by ACS and IISc, Bangalore during January 29-31st, **2024**.
j. Invited talk, Advanced Carbon Support Materials for Proton Exchange Membrane Fuel Cells, in *IEEE Nanotechnology council sponsored winter school on "Nanotechnology for Sustainable Growth and Development"* organized by Department of Physics Kumaraguru College of Technology, Coimbatore during 8-13th January **2024**
k. Invited talk, Advanced Carbon based Electrocatalyst Support Materials for Durable Proton Exchange Membrane Fuel Cells in "*International Conference on Advanced Materials for Sustainability (ICAMS-2023)*" organized by School of Physical Sciences, University of Calicut, 21-23rd December, **2023**
l. Invited talk, Surface Engineering on Mesoporous Carbon Nanofibers based Electrocatalyst Support Materials for Boosting Durability of PEM Fuel Cells in *Energy Summit 2023* Organized by Energy Consortium, IIT Madras during 6-8th December, **2023**
m. Invited talk, Towards Clean Energy: Proton Exchange Membrane Fuel Cells in *International Seminar on Advanced Nanomaterials* organized by Department of Chemistry, Little Flower College, Guruvayoor, Kerala on 24th November, **2023**
n. Invited talk, Advanced Materials for Proton Exchange Membrane Fuel Cells in *National Seminar on "Electrochemistry - The Future of Energy Storage"* Fatima Mata National College, Kollam on 17th November, **2023**
o. Invited talk, on "Nanotechnology-Enabled Chemical Sensors for Sustainable Precision Agriculture" in a National Conference entitled "*National Conference on Next Generation Sustainable Technologies for Indian Farmers*" organized by School of Agricultural Sciences at Dhanalakshmi Srinivasan University, Tiruchirappalli. on 26th August, **2023**
p. Guest Lecture on "*Surface Enhanced Raman Spectroscopy for Biological Applications*" Department of Electronics and Communication Engineering, PSG College of Technology is organizing the AICTE –ISTE sponsored One Week Online Induction/Refresher Programme on '*NANOTECHNOLOGY IN HEALTHCARE*' on 11th January **2022**.
q. Resource person in the SERB sponsored work shop on "*Ways and means to improve the high quality research proposa*l" at PSGR Krishnammal College for Women, Peelamedu, Coimbatore and delivered a talk on "*Grant writing: Overview and Opportunities"* held on 20th December **2021**
r. Resource person for "*Professional Certificate Course on "Analytical and Phytochemical techniques*" organized by the Bharat Ratna Prof. C N R Rao Research Centre, Avinashilingam Institute for Home Science and Higher education for Women, Coimbatore, and delivered a talk on "*Raman Spectroscopy for Nanomaterial Characterization*" on September 20th, **2021**.
s. Resource person for "Nano-Enabled Devices and Products" internship program organized by National Center for Nanoscience and Nanotechnology (NCNSNT),

Madras University and delivered a talk on "*Functional Nanoscale Materials for Gas Sensor Applications*" on Jan 7th, **2021**.

t. Invited talk on "*Functional Materials for gas sensing applications*" during "*International Webinar Series on Advanced Functional Materials 2021*" organized by the Department of Chemistry, Zamorin's Guruvayurappan College kozhikode on 26th June, 2021.

u. Resource person for AICTE sponsored STTP Program titled "*Nanomaterials for Clean Energy and Environmental Applications*" and delivered a talk on "Recent *Advances in Front Contact Grid Metallization for Silicon Solar Cells*" organized by Dr. Mahalingam College of Engineering and Technology, Pollachi on 6th November, **2020**

v. Resource person for AICTE ATAL sponsored FDP Program on "Solar Energy: Technologies and Applications" and delivered a talk on "*Advanced Front Contact Grid Metallization for Silicon Solar Cells*" organized by Jyothi Engineering College, Trissur on 25th September, **2020**

w. Invited talk on "*Durable, Mesoporous Carbon Support Materials for Proton Exchange Membrane Fuel Cells*" during 1st International Conference on Frontiers in Chemical Sciences (ICFCS-2020) at Department of Chemistry, Karunya Institute of Technology and Sciences, Coimbatore, March 5th, **2020**.

x. Guest Lecture on "*Bio-inspired Superhydrophobic Surfaces: Natural to Artificial*" organized by Department of Chemistry, PSGR Krishnammal College for Women, Coimbatore, 21st February, 2020.

y. Invited talk on "*Functional Nanoscale Materials for Gas Sensor Applications*" at "*DST-CURIE sponsored National Seminar on "Global Trends in Science and Engineering*" organized by Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore on 20th September, **2019**.

z. Invited talk on "*Smart Functional Materials for Gas Sensor Applications*" during *One Day National Seminar on "Smart and Functional Materials"* organized by Department of Chemistry, PSG College of Arts and Science, Coimbatore on 2nd August, 2019.

aa. Invited lecture on "*Mesoporous Carbon nanofibers based electrocatalyst materials for PEM fuel cells*" at TEQIP-III sponsored FDP on "*Emerging Trends in Science and Technology (ETSTS-2018*) organized by Department of Chemistry, Coimbatore Institute of Technology, Coimbatore on 11th December, **2018**.

bb. Invited talk on "*Recent Advances in Multimode scanning probe microscopy*" during two day training programme on "*High resolution Transmission Electron Microscopy, Scanning Electron Microscopy and Scanning Probe Microscopy*" at PSG Institute of Advanced Studies, Coimbatore on 14th September, **2018**.

cc. Invited talk, *3rd International Conference on Nanomaterials: Synthesis, Characterization and Applications (ICN 2018),* at Mahatma Gandhi University, Kottayam, Kerala on 11th May, **2018**.

dd. Invited talk, "*National level Conference on "Biosensors: A Pharmaceutical Perspective"* at PSG Pharmacy College, Coimbatore on 28th April, **2018**.

ee. Invited talk on "*Multiwalled carbon Nanotubes based gas sensors for Clinical Breath analysis*" during AICTE– QIP Sponsored Short Term Course on "*Current Scenario in Nano and Biotechnological Applications (CSNBA)"* at Department of Chemical Engineering, Coimbatore Institute of Technology, Coimbatore on 6th April, **2018**.

ff. Invited talk on ''*Functional carbon Nanotubes based gas sensors for Clinical Breath analysis"* during *Post-Centenary Diamond Jubilee–"National Seminar on Recent Trends in Nanobiosensors-2018"* at Department of Chemistry, University of Madras on 22nd Feb, **2018**.

gg. Invited talk on "*Multimode scanning probe microscopy-Beyond imaging*" during "*National Seminar on Emerging Trends in Nanomaterial science and Technology*" at Department of Chemistry, SNGS College, Pattambi, Palakkad, Kerala on 20th December, **2017**.

hh. Invited talk on "*Multimode scanning probe microscopy-Beyond imaging*" during two day training programme on "*High resolution Transmission Electron Microscopy, Scanning Electron Microscopy and Scanning Probe Microscopy*" at PSG Institute of Advanced Studies, Coimbatore on 23rd and 24th November **2017**.

ii. Invited talk on "*Nanotechnology-Enabled Gas Sensors for Clinical Breath Analysis Applications*", during "*AICTE sponsored Quality improvement programme on SMART ADVANCED MATERIALS (SAM)*" 14th November, **2017**.

Total Number of Conference Papers/Proceedings: 80+

Professional Body Membership:

- Material Research Society of India (MRSI) – Life Member (LMB2040)
- Chemical Research Society of India (CRSI) – Life Member (LM 4282)
- Society for Materials Chemistry – (SMC India) – Life Member (LM-2029)
- Electrochemical Society of India (ECSI) - Life Member (LM-485)
- Institute for Smart Structures and Systems (ISSS) – Life Member (LM-490)
- Indian Society of Systems for Science and Engineering (ISSE)- Life Member (LM-05480)

Training/Workshops/Conferences organized

- "*Two Days Workshop on Prospects for Li-ion Batteries and Emerging Electrochemical Energy Systems*" jointly organized by PSG Institute of Advanced Studies, Coimbatore and ECS-IIT Madras Students Chapter during July 29-30th, **2024** (***Convener***).
- One Day Thematic Meet on *"The Many Faces of Colloids & Interfaces*" for honoring Prof. Archita Patnaik during her superannuation at Dept of Chemistry, IIT Madras on 15th June, **2024** (***Convener***)
- "*International Conference on Advances in Micro/Nanotechnologies for Biological Applications (ICAMB-2015)*" organized by PSG Institute of Advanced Studies, Coimbatore during 7-8th August, **2015** (***Convener***).
- "*Two Day Workshop on High resolution Transmission Electron Microscopy, Scanning Electron Microscopy and Scanning Probe Microscopy*" organized by PSG Institute of Advanced Studies, Coimbatore during 15-16th December, **2016**. (***Joint Organizing secretary***).
- "*Two Day Workshop on Scanning Probe Microscopy and High Resolution Transmission Electron Microscopy*" organized by PSG Institute of Advanced Studies, Coimbatore during 23-24th January, **2015**. (***Joint Organizing secretary***).
- "*Two Day Awareness training programme on Scanning Probe Microscopy and High Resolution Transmission Electron Microscopy*" organized by PSG Institute of Advanced Studies, Coimbatore during 25-26th February, **2011** (***Organizing secretary***).
- "*High resolution Transmission Electron Microscopy, Scanning Electron Microscopy and Scanning Probe Microscopy*" organized by PSG College of Technology, PSG Institute of Advanced Studies and PSG-STEP, Coimbatore during 13-14th September, **2018**. (***Joint Convener***).

- "*One day Sensitizing Programme on Multimode Scanning Probe Microscopy*" organized by PSG Institute of Advanced Studies, Coimbatore on 9th March, **2019** (***Organizing secretary***).

Hands on Training/Workshops

- Selected candidate from Indian Institute of Technology Madras, by the Indo-France exchange program for participating in the Nanotechnology hands on training program *"European School on Nanosciences and Nanotechnologies (ESSON-2007)"* organized by University of Joseph Fourier and INPG, conducted in **Grenoble, France** from August 26th to September 15th, **2007**
- Undergone hands on training workshop "*INUP Hands on Training on Nanofabrication Technologies*" organized by Indian Nanoelectronics Users Program (INUP) at Center of Excellence for Nanoelectronics, **IISc, Bangalore** from 15th-24th April **2010.**
- Nominated and participated in "*Brain Storming Workshop on Sensors and Related Technologies for Sustainable Agriculture*" jointly organized by Office of Principal Scientific Adviser to GoI and Indian Council of Agriculture Research (ICAR) at NASC Complex, **ICAR, New Delhi** on 18th September, **2014.**

Teaching courses handled

- BE/BS Mechanical Engg. (PSGIAS) Course :
  Fundamentals of Physical Chemistry (BE/BS Mech, 1st Sem)
  Chemistry of Engineering Materials (BE/BS Mech, 2nd Sem)
  Chemistry Laboratory-I (B.Tech Biomed, 1st Sem)
  Chemistry Laboratory-II (B.Tech Biomed, 2nd Sem)
  Chemistry Laboratory-II (BE/BS Mech/Mechatronics)
  Chemistry Laboratory-II (BE/BS CSE/Innovative Textiles, 2nd Sem)
- MS Material Science & Engineering (PSGIAS) : Synthesis of Nanomaterials
- M.Tech Nanotechnology (PSG College of Technology, Dept of ECE.): Nanosensors and Devices
- M.Sc. Applied Chemistry (PSG College of Technology, Dept of Chemistry):
  Physical Chemistry – I (Core)
  Applications of Nanotechnology (Elective)

M.Tech/ME/M.Sc. Projects : 40

B.Tech/BE/B.Sc projects supervised :15